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Space Nuclear Systems Office



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(FEATS) Finite Element Thermal Stress Analysis of Plane or Axisymmetric Solids

The problem:

To obtain the following: (1) a two-dimensional steady state temperature distribution and the resulting thermal stress distribution in a plane or axisymmetric solid body, and (2) contour plots of the resulting distributions.

The solution:

The FEATS computer code, developed to solve the two-dimensional thermal stress problem.

How it's done:

The FEATS computer code uses finite element analysis to calculate the steady state temperature and stress fields for either axisymmetric or plane two-dimensional bodies with boundary conditions, including specified displacements, loads, and thermal boundary conditions.

The program was designed to be a general purpose code for solving linear and bi-linear stress-strain problems, thermal stress and temperature fields. The program allows the calculation of temperature distributions for materials in which the thermal conductivity is a function of temperature. The code will also

calculate the axial stress in plane strain type bodies which are free to warp.

Notes:

1. The code is available with capacities of up to 3000 nodal points and 2000 elements. A direct solution method which gives accurate results with reasonable computer times is used.
2. This program is written in FORTRAN IV and Assembly languages for use on the IBM 360/75 or CDC 6600 computers.
3. Inquiries concerning this program may be directed to:

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Source: John A. Swanson of
Westinghouse Astronuclear Laboratory
under contract to
AEC-NASA Space Nuclear Systems Office
(NUC-10242)

Category 09